Unconsolidated Aquifer Systems of Monroe County, Indiana

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Four unconsolidated aquifer systems have been mapped in Monroe County: the Dissected Till and Residuum; the Alluvial, Lacustrine, and Backwater Deposits; the Pre-Wisconsin Drift; and the White River and Tributaries Outwash. Boundaries between the systems are relatively well defined. With the exception of the White River and Tributaries Outwash Aquifer System, unconsolidated aquifers in the county do not have much potential for development of successful water wells. Drillers prefer to try a well in the underlying bedrock. However, that too is relatively limited, and many county residents prefer to tap into a public water supply system serving much of the county.

Regional estimates of aquifer susceptibility to surface contamination can differ considerably from local reality. Variations within geologic environments can cause large variations in susceptibility. Also, man-made structures such as poorly constructed water wells, unplugged or improperly abandoned wells, and open excavations, can provide contaminant pathways that bypass the naturally protective clays.

Dissected Till and Residuum Aquifer System

The Dissected Till and Residuum Aquifer System covers most of Monroe County. It has the most limited ground-water resources of the unconsolidated aquifer systems. The unconsolidated deposits include weathered bedrock residuum in most of the county and remnants of predominantly pre-Wisconsin glacial drift within a two or three mile fringe along the north border with Morgan County and the northwest border with Owen County. Total thickness of the unconsolidated materials overlying bedrock ranges from 0 to 80 feet but is commonly from 6 to 25 feet.

Clay material dominates this unconsolidated aquifer system, whether it is bedrock residuum or remnants of glacial drift. However, within the drift may be scattered lenses of sand or gravel. These are rather thin, commonly only 1 to 3 feet thick. Where only bedrock residuum is present, the chances for completing a successful drilled well in these materials are practically zero.

The Division has no record of drilled wells actually producing from this system. A few old dug wells may still exist in the county, but their yields would be very low. Because of the low permeability of the surface materials , this system is not very susceptible to contamination from surface sources.

Alluvial, Lacustrine, and Backwater Deposits Aquifer System

The Alluvial, Lacustrine, and Backwater Deposits Aquifer System is made up of heterogeneous bodies of alluvial, colluvial, and lacustrine materials within valley bottoms and terraces of some larger streams tributary to White River. These include Beanblossom Creek and Salt Creek.

Unconsolidated deposits within the system include Wisconsin and Holocene (Recent) silt, sand, and gravel along streams and terraces as well as pre-Wisconsin age colluvial, alluvial, and lacustrine silt, clay, and sand. The lacustrine deposits are older lake materials formed in bodies of relatively stagnant water. These deposits are attributed to the White River valley becoming choked with outwash from receding glaciers. The outwash deposits effectively dammed the tributary streams, thus creating lakes in which several feet of fine-grained glaciolacustrine deposits accumulated.

This aquifer system is an extremely limited resource and the Division has no records of wells actually producing from these deposits. The potential does exist, however, for completion of adequate domestic wells. Large-diameter bucket-rig wells are often successfully employed when other means of extracting seepage from limited or fine-grained deposits are not available.

Sand and gravel lenses, when present, are commonly less than 5 feet thick and may be confined within the glaciolacustrine deposits or directly overlie bedrock. The total thickness of unconsolidated materials overlying bedrock in this system can be as much as 80 feet where Beanblossom Creek joins the White River. However, the thickness typically ranges from 25 to 40 feet. This aquifer system is generally marked by surface deposits of soft silt and clay that have low susceptibility to surface contamination.

Pre-Wisconsin Drift Aquifer System

The Pre-Wisconsin Drift Aquifer System is present in only two small areas of Monroe County. This aquifer system is a limited resource, as evidenced by the lack of wells actually producing from the available unconsolidated deposits. However, the unconsolidated deposits overlying bedrock consist of dominantly pre-Wisconsin glacial till materials that range in thickness from 30 to 195 feet.

Potential aquifer materials within the glacial till include discontinuous intratill sand and gravel units. These are sometimes described by well drillers as a mixture of “muck, sand, and gravel.” Drillers often note water-bearing unconsolidated deposits, even though they complete the wells in bedrock. Sand and gravel deposits are reported up to 10 feet thick, or more, but are typically 3 to 5 feet thick. Drillers have reported more than one sand and gravel unit in deeper wells.

Even though drillers bypass the unconsolidated deposits, preferring the underlying bedrock aquifer system, the potential certainly exists for completion of adequate domestic wells in this unconsolidated aquifer system. This aquifer system has thick deposits of pre-Wisconsin till that are dominantly clay and loam materials overlying the aquifer resource. The susceptibility to contamination is therefore low.

White River and Tributaries Outwash Aquifer System

The White River and Tributaries Outwash Aquifer System is located in the northwest corner of Monroe County near the confluence of White River and Beanblossom Creek. The system is made up of large volumes of outwash materials that were deposited within the White River valley by the retreating continental ice sheets.

The outwash materials consist predominantly of sand and gravel deposits that may be overlain in some areas by thin clay and/or silt materials. This unconsolidated aquifer overlies bedrock and typically ranges from 70 feet to 90 feet in thickness.

Unfortunately, there are no known domestic or high-capacity wells completed in the Monroe County portion of the system. However, the town of Gosport, located in Owen County, has 3 wells completed in the aquifer system at depths of 50, 75, and 90 feet. Yields of up to 500 gpm have been reported. This aquifer system has the greatest potential of any aquifer system in Monroe County and can meet the needs of high-capacity water users. This aquifer system is highly susceptible to contamination in areas that lack overlying clay layers. Areas within the system that are overlain by thick layers of clay or silt are moderately susceptible to surface contamination.

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